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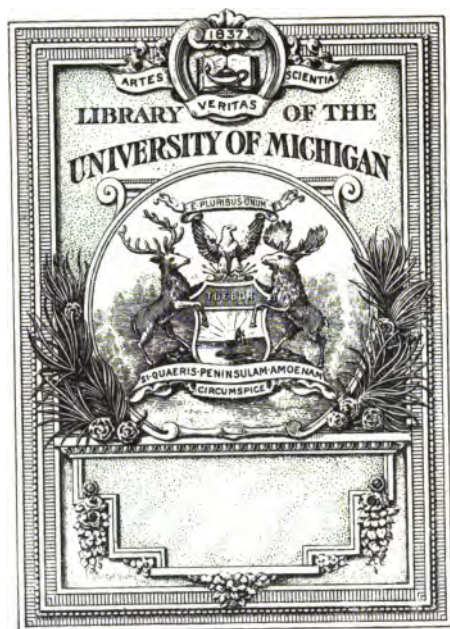
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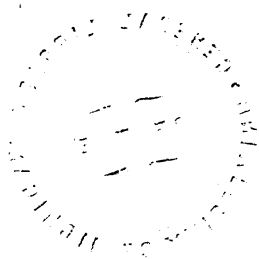
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From Prof. M. W. Harrington

THE
HYPERBOLIC CURVE

AND,
THE LAW OF PROGRESSION OF
ROTATING BODIES.

BOSTON:
A. WILLIAMS AND COMPANY.
Old Corner Bookstore.
1882.

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UNIVERSITY PRESS:

JOHN WILSON AND SON, CAMBRIDGE.

PLANETARY ROTATION.

THE ELECTRIC THEORY OF AXIAL AND ORBITAL ROTATION.

ACCORDING to a late theory,¹ electricity induced by a vast solar battery is the great and unique force of the universe, by which all celestial bodies are propelled in their orbits. The sun is electrically excited by a swift rotation on its axis opposite to the several planets, each similarly excited by rotation on its axis. This axial rotation induces electric currents around the sun and around each of the planets, which thus become polarized.

THE AURORA BOREALIS ELECTRIC.

With the extraordinary magnitude of the central orb, combined with its extreme velocity of rotation, a correspondingly greater intensity of

¹ Ch. 6, Solar Light, Heat, and Gravitation. By Z. Allen. Appleton & Co. 1st ed., 1879.

electric excitation of the solar electro-sphere is to be anticipated. The solar flashings and coruscations dart thousands of miles in tongues of flame, and correspond to earth's fainter Aurora Borealis, and are all electric.

Electricity furnishes the key to all physical phenomena, even to the working of the brain and the pulsations of the heart.¹ Man's journeyman machines display but very imperfectly this mighty power.

ELECTRIC ATTRACTION AND REPULSION THE
CAUSE OF THE ELLIPTICITY OF THE EARTH'S
ORBIT.

Newton showed "that if the sun describes elliptical curves according to laws (the discovery of which is due to Kepler), it is because they are submitted to a constant force, located, as it were, in the sun,—a force the direction of which is that of a radius vector or right line, which joins the planet and the common focus."

The theory is thus stated:² The elliptical orbit of the earth may be produced by the (so-called) attraction of poles of contrary names of the sun and earth propelling them apart in one direction in summer, and the (so-called) attraction of poles

¹ Solar Light, Heat, &c., ch. 24.

² Ibid. p. 232, ch. 26.

of contrary names of the sun and earth propelling them together in another direction in winter.

The apsis line connects the aphelion and perihelion points and passes through the sun, so that the most direct and powerful repulsion and attraction between the sun and earth occurs at these points.

“If an axial rotation as well as an horizontal rotation is communicated by an impulsive force, analysis shows that it may be applied in any plane intersecting the horizontal in the line of nodes ; but if applied in the plane of the equator (where it can communicate nothing but an axial rotation), or in the horizontal plane, its intensity must be infinite.”¹

At the equinoxes the earth is subjected to an intense electric sun-current, which propels the planet over the equinoctial point.

Kepler's second law is thus stated : “In the motion of a planet around the sun the radius vector drawn from the centre of the sun to the planet sweeps over equal areas in equal times. Every planet moves round the sun with variable velocity, and more rapidly as it approaches the common focus. The earth, therefore, moves

¹ J. G. Barnard on the Gyroscope, p. 559.

less quickly during the summer season of the northern hemisphere than during the winter season." There is therefore in the heavenly bodies varying velocity, with compensating axial and orbital movements.

The same laws of magnetic force may be assumed to govern the revolution of the solar system in its vast orbit around the central sun, occupying twenty-six thousand years, as govern the revolution of our earth around its sun. The marvellous magnetic variations and swayings, which seem at present beyond the power of man's calculation and comprehension, may perhaps some day be found to coincide with the magnetic laws of the earth's translation, with the difference in scale of twenty-six thousand years to one.

THE GYROSCOPE GOVERNED BY THE SAME LAWS
AND PROPELLED BY THE SAME FORCE AS THE
EARTH.

In a hitherto undiscovered solution of the cause of the movements of the gyroscope¹ is found the confirmation and illustration of the electric theory. The gyroscope is thus described, and the unity of the gyroscope and the earth in their modes of motion: —

¹ Solar Light, Heat, &c., pp. 235, 236.

At rest, the gyroscope is a grouping of molecules, or a molecular arrangement. Pre-existing electric currents are present; but moving in all directions, they neutralize each other. In order to bring the gyroscope into an electro-dynamic condition, a diamagnetic current must be induced around it sufficiently intense to overpower the terrestrial currents. This induction can be effected by whirling the disc, like a humming-top, by a string wound round its axis, in which case the impulse will soon be exhausted; or by an electric current, when a relative continuity of action can be obtained, better illustrating the effect of the terrestrial currents.

The law controlling the movements of the gyroscope is as follows: When a body is acted upon by two systems of forces tending to produce rotation about two separate axes lying in the same plane, the resultant movement will be rotation about a new axis situated in the same plane between the directions of the other two. It is coincident with the standard point.

If the weight be placed near the fulcrum, so as slightly to underbalance the disc, beside rotating rapidly on its axis, it begins a slow, orbital revolution in the direction in which the underside of the disc is moving.

By attaching the arm and counterweight so as to balance the disc exactly on the pointed standard, the orbital revolution ceases, while the axial rotation continues till the impulse is exhausted.¹ By overbalancing the disc, the horizontal revolution is persistently maintained, but changed to an opposite direction — the direction in which the top of the disc is turning. During the changes the disc rotates in a constant direction.

In comparing these two electro-magnets, we find that the gyroscope, like the earth, has its diamagnetic current and polarity; its axial and orbital revolutions; its compensating movements and relative static and dynamic conditions, the symmetrical or equilibrial placing of its axis, answering to the earth's equinoctial position when the orbital revolution of the gyroscope, at least, ceases; a declination of the axis when the orbital revolution of the gyroscope is in the same direction as the underside of the disc; and an upward inclination of the axis when the orbital revolution is reversed, and is in the direction of the upper side of the disc, answering to the perihelion and aphelion positions.

The rotation both of the earth and the gyroscope is in a constant direction in the three differ-

¹ Solar Light, Heat, &c., fig. 66, p. 236.

ent positions of their axes during their orbital revolution; and as the gyroscope in opposite positions of its axis moves in opposite directions, may we not infer, as a possibility, similar movements for the earth?¹

The equinoctial position is clearly illustrated by the gyroscope when its axis is exactly balanced on the standard, and the orbital revolution ceases while the axial rotation continues.

Terrestrial analogies afford us a very sure guide in the midst of many perplexities, and the continued movements of the gyroscope fulfil each function as completely as the like movements of the earth, and we may reasonably assume that they are governed by the same laws.

The gyroscope seems to be a working model of all electro-magnets, from the earth to the minutest molecule.

THE HYPERBOLIC CURVE A CLOSED ORBIT, LIKE
OTHER ORBITS IN THE PLANES OF THE CONIC
SECTIONS.

The periodical return of bodies to the same place is the great law of astronomy.

¹ To say that the equinox falls back or retrogrades is the same as saying that the plane of the equator has varied in position, and as the axis of the earth is always perpendicular to this plane, it follows that this axis has not remained rigorously parallel to itself. The Heavens, p. 456. Guillemin.

The hyperbolic curve consists of two branches, and occupies different portions of space; but if a body be moving in one of the branches, it can never by any possibility be transferred to the other, — its course growing more and more nearly rectilinear, till it ultimately moves sensibly in a straight line.

The theory that the hyperbolic curve is an open orbit is founded on the supposed fact, that the path of the orbit, after a certain distance in space is traversed, becomes rectilinear; and this rests on the received law that gravitation acts inversely as the square of the distance.

Faraday says: "If gravity acts inversely as the square of the distance, then the earth at aphelion could not, without the aid of some other force or interfering cause, be returned to perihelion, but the lessening attraction would permit it to move on indefinitely into space."

In this open-orbit theory no cognizance is taken of the extraneous force of the intense electric sun-current which causes a celestial body, being at an equinoctial point, to pass on and complete its circuit.

The electric sun-current, a hitherto unrecognized factor, is now seen to bear on that point of the hyperbolic orbit corresponding with the



earth's equinox; and a celestial body moving in that orbit is regulated like the earth in every particular, having its aphelion, perihelion, and equinoctial points and major and minor axes.

The minor axis of the hyperbolic orbit lies doubtless at that point where the curve of the orbit would, if continued, pass into a straight line, and the extraneous force of the electric sun-current propels the celestial body over the equinoctial point, and, like all other heavenly bodies, it returns to the place from whence it started, being governed by the same laws and propelled by the same electric force.

The centripetal force of the sun and the uniform direction of rotation and translation of all the planets from west to east must induce a continuous electric current which conjoins the planets of the solar system as one electrode, bringing it into the same connection with the great central sun as exists between our sun and earth.

LAW OF PROGRESSION OF ROTATING BODIES.

THE great law of astronomy, "a periodical return of heavenly bodies to the same place," is equally true of every rotating body.

A rotating body held at the two poles of its axis is at its equinoctial point, having a rotation without a revolution; but after acquiring a certain velocity the great compensating law of orbital revolution asserts itself, and, if the body is still held at its axis, the molecules composing it are propelled apart with great violence. This so-called centrifugal force causes the bursting of revolving wheels and millstones.

Each rotating body is an independent sphere, and, if free to move, would possess an orbital revolution as well as an axial rotation, in accordance with its law of progression.

"In the science of mechanics the first law of motion is that all motion is in itself (that is to say, except as affected by extraneous forces), uniform in velocity, and rectilinear in direction. Thus, according to this law a body moving and not sub-

ject to any extraneous force, would go on moving forever at the same rate of velocity, and in an exactly straight line. Now, there is no such motion as this existing in the earth or in the heavens! . . . Not only is there no such motion in nature, but there is no possibility by artificial means of producing it. It is impossible to release any moving body from the impulses of extraneous force. The first law of motion is therefore purely abstract.”¹

The law of progression of rotating bodies is not rectilinear, but in a curve, in the plane of one of the conic sections. “Infinite rectilinear progression in finite space is impracticable.”

The collision of bodies moving in right lines would be fatal to that order, which is Heaven’s first law. There are no loose ends in the handiwork of Him who planned the heavens.

The so-called tendency of matter to move in a straight line may prove to be but the law of orbital revolution, which asserts itself the moment independence of terrestrial currents is achieved by an imparted axial rotation.

The apparent straight line may be but the arc of an orbit, and all of it that we are able to observe, owing to feebleness of impulse in projection or interference in progression.

¹ Reign of Law, pp. 109, 110.

A recent cyclone in the West is described as not only pursuing a zigzag course, but also as moving upward and downward, and having a circular as well as forward motion at the same time.

In cyclones often the beginning and completion of the orbital revolution can be observed, while the axial rotation is not only visible, but its velocity can be calculated.

THE BOOMERANG.

In the eccentric movements of the boomerang we see an orbital revolution as well as an axial rotation.

A writer, after many years' observation in Australia,¹ reports "that when the missile was thrown in a plane perpendicular with the horizon, it revolved with great velocity for about one hundred yards, when it became inclined to the left, travelling from right to left. It then circled upward, the plane in which it revolved indicating a cone, the apex of which would lie some distance in front of the thrower. When the boomerang, in travelling, passed round to a point above and somewhat to the right of the thrower, and perhaps one hundred feet above the ground, it

¹ The Boomerang. The Galaxy, February, 1877.

appeared to become stationary for a moment ; I can only use the term 'hovering' to describe it. It then commenced to descend, still revolving in the same direction ; but the curve followed was reversed, the boomerang travelling from left to right, and, the speed rapidly increasing, it flew far to the rear. At high speed a sharp, whistling noise could be heard.

" If thrown in a plane considerably inclined to the left, it flew forward the same distance as before, gradually curving upward, when it seemed to soar just as a bird may be seen to circle upward with extended wings. The boomerang, of course, was all this time revolving rapidly.

" If the boomerang was thrown in such a manner that it would strike the ground with its flat side some distance in front of the thrower, it would then rise upward in a spiral, returning in the same."

The boomerang appears not only to have an axial rotation and orbital revolution, but an equinoctial point in its orbit, where it became stationary for a moment.

Man reasons in regard to the works of his fellow-man, that there is no effect without a cause, no originating cause without a will, and

no will without a personality. Is the reasoning less cogent when applied to ONE whom we have not seen, but whose works, cunningly devised and perfect, declare and insist on an originating will and a personality?

The revolving of the planets around our sun, and of the solar systems around the great central sun, their varying magnitudes, the different lengths of their orbits, the variable velocities in their axial rotations and in their orbital revolutions, the differing density and weight of the heavenly bodies, no atom of which is ever lost, are proofs of design, and of an infinite delicacy and supreme wisdom in the determination of distance, direction, and of velocity of projection.

The mind of God planned every initial circumstance. He "hath measured the waters in the hollow of His hand, and meted out heaven with the span, and comprehended the dust of the earth in a measure, and weighed the mountains in scales and the hills in a balance;" who said, "Let there be light, and light was." "He spake, and it was done." The multitudinous spheres came forth from His almighty hand, and, luminous with His living light, glided each into its own orbit, a perfect system of worlds.

